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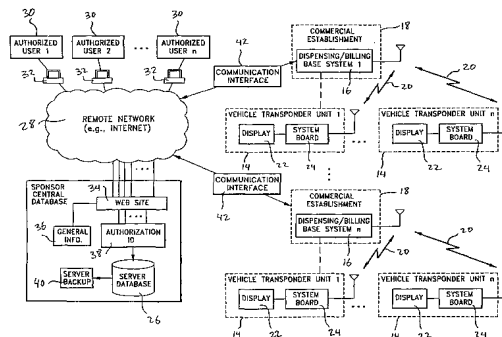
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(54) Title: SYSTEM FOR DELIVERING MEDIA MESSAGES TO VEHICLE OCCUPANTS AND METHOD OF USING THE SAME



(57) Abstract: In accordance with the present invention, there is provided a system for delivering a plurality of media messages to the occupants of a vehicle (14) positionable adjacent a commercial establishment (18). The system is provided with a vehicle interior-attachable transponder programmed with customer identification data. The transponder includes a vehicle occupant-viewable graphical display unit (22) for displaying a plurality of media messages visible to the vehicle occupants. The transponder further includes a establishment and for outputting the media messages to the graphical display unit. The transponder further includes a timer unit for measuring accumulated exposure to media messages by the vehicle occupant. The transponder further includes a transponder communications port for creating a datalink between the transponder and the commercial establishment (20). The system is further provided with a dispensing/billing base system (16) located at the commercial establishment for electrically interrogating the transponder and receiving customer identification data and transponder usage data in response. The base system includes a billing discount unit operative to reduce cost of goods and services based on detected cumulative operating time of the graphical display unit. The base system further includes a base system communications interface for communicating with a remotely-located central database server via a remote network. The base system further includes and at least one communications channel board for sending media messages to the transponder.

WO 02/09308 A1

-1-

SYSTEM FOR DELIVERING MEDIA MESSAGES TO VEHICLE OCCUPANTS AND METHOD OF USING THE SAME

BACKGROUND OF THE INVENTION

5 The present invention generally relates to the field of media message delivery systems and particularly to systems which deliver media messages to vehicle occupants in a vehicle positionable adjacent a commercial establishment and a method of using such systems.

10 Media messages serve several purposes as public service announcements and emergency broadcasting. Through the use of television and radio, useful services may be provided to alert the general audience of such things as health risks, problems in society, political views and instructions for emergency situations. However, the most commonly used form of media message is the advertisements. Advertisements serve as highly effective tools in persuading consumers to purchase a product, promote a service, 15 announce new product, offer special incentives and discounts, promote a brand name, and countless other ways of informing the public that a particular business has something valuable to offer. The underlying assumption that advertisements generate business is based upon the premise that consumers who are visually and/or audibly stimulated by interesting ideas will make a mental note of the product, service or brand name. It then 20 follows that the subconscious cognizance of such advertisements may invoke the consumer to make a purchase or subscribe to a service associated with the perceived advertisement. Advertisements are especially effective in promoting a brand name when the advertisement reaches a consumer who possesses little or knowledge about a particular type of product, service or brand name. For example, a consumer who 25 observes a television commercial favorably describing the features of "Band A's Product" may be more inclined to purchase that product if they are unfamiliar with any of the competing brand names. The respectability of a brand name is commonly built through the use of advertisements and consequently, many consumers rely upon such advertisements as representations of the reliability and quality of the associated products 30 or services. Throughout history, the use of such advertisements has been highly effective for businesses in selling their products, marketing their services, and promoting their brand names.

-2-

Advertisements have proven to be highly effective, yet the success of advertising varies a great deal depending on the medium chosen to deliver a business' message. Typically, the first step to producing an advertisement is choosing a proper medium. Some of the commonly known conventional advertisements take the form of flyers, posters, billboards, radio commercials, and television commercials. Advertisements in the form of flyers and posters have the potential of reaching a smaller group of consumers in comparison to billboards, radio commercials, and television commercials. At the same time however, the cost of producing advertisements significantly increases in tandem with the potential number of consumers the medium may reach. For example, a car manufacturer that is planning the release of a new car model may have a large enough marketing budget that allows the car manufacturer to utilize all possible channels of advertisement in promoting the new car. In comparison, businesses with a smaller budget may opt to use billboards exclusively, while businesses with a minimal budget may opt to use billboards exclusively, while businesses with a minimal budget may only have the ability to market their products and services through flyers. Nonetheless, the choice of medium is typically dependant upon such factors as the available marketing budget and the effectiveness of a particular medium for achieving the intended purpose. It is the objective of creating the advertisements that consumers may be persuaded to purchase a particular product, or perhaps spark enough curiosity in the potential customer that they will inquire further about the product and eventually purchase it.

A common way that advertisers capture the attention of a consumer is by offering a free product or service to the consumer. The underlying rationale of businesses offering free products and services is to create an incentive for the consumers. Although businesses lose the cost of the product or service given away to the consumers, the objective is to recover the lost profit by gaining future business from the benefitted consumers. Consumers are content with receiving free products and services but such a system of advertising is not always effective where consumers merely take free products and services from the business and never return their patronage. Thus, offering free products and services has generally been successful in gaining the attention of potential customers, but businesses are continually striving to retain customer loyalty.

Gasoline consuming vehicles comprise a majority of the vehicles used commonly throughout the world for transportation. It follows that the supply and cost of gasoline

-3-

to fuel such vehicles has always been an important issue for consumers. Oil companies and gasoline service stations constantly attempt to gain customer loyalty by claiming that a particular additive in their gasoline is better than a competitor's and use numerous other tactics to gain more business. At the same time, oil companies and gasoline service stations have a difficult time convincing consumers to purchase their gasoline over another's while the price of oil and gasoline continues to be highly volatile. In general, it is difficult for a consumer to determine whether one company's gasoline is truly better than another's. The differences between the competing gasolines may be subtle and less apparent to the consumer, especially when the selling point of most gasolines is an additive that typically works "invisibly" by doing such things as cleaning fuel injectors and valves. Thus, the ultimate strategy for oil companies and gasoline service stations is to use vigorous advertising targeted at the consumer who has no loyalty to any particular oil company. Some oil companies and services stations accomplish this by offering competitive gasoline credit cards with incentives or focusing advertisements on the wide selection of products available in their convenience store. However, the ultimate selling point for most consumers is the bottom line - price.

Although the goal of retaining customer loyalty is apparent in the gasoline business, the problem is not exclusive to this industry. Any other business is likely to have the same problem of retaining customer loyalty where several competitors are present. For example, fast food service stores have an enormous amount of competition and have difficulty convincing consumers that their products are better than a competitor's. Foods are especially difficult products to sell because the tastes of each individual varies and it is difficult to accurately describe to the general audience what a particular food tastes like. In addition, superior products and services may attract a certain portion of customers, yet a large number of potential customers use price as the most important factor in choosing a business. Thus, other businesses, including fast food services stores, experience the same difficulty in retaining customer loyalty.

A reasonable solution to such a dilemma is to formulate a method of providing consumers with discounted products and services for continuing to give their patronage to a particular business. Such a solution should not only benefit the consumer but also ensure that the businesses are equally benefitted. It then follows that a consumer who

-4-

receives a discount on products and services from one business versus another is more likely to retain their loyalty towards that business for as long as the incentive exists.

Advertisements have proven to be highly effective in conveying a message to consumers regarding a business' products, services, and brand name. The methods of advertising take many forms and the chosen medium of advertising depends upon several factors including the available revenue of the business. Offering free products and services has historically been an effective way of gaining new customers but this method is not completely without disadvantages. It is therefore evident that there exists a need in the art for a media message delivery system which accomplishes the purpose of retaining customer loyalty and benefits all parties involved by providing discounted goods and services.

Some of the prior art generally discloses automobile navigations systems and electronic vehicle billboard systems, while others formulate efficient methods of utilizing broadcast signal transmissions to communicate with these devices. Such systems may be useful in directing automobile drives to their desired destinations and some may provide location sensitive advertisements. A system embedded in the automobile facilitates the transmission of data from an external transmission source for navigation. Typically, global positioning satellite (GPS) technology is used to help indicate the initial and final locations of the driver. These systems are generally directed at providing automobile navigated systems. Other inventions contemplate the use of microwave signals to transmit information to the embedded navigation systems and vehicle billboard systems. For example, a common use of microwave signals is implemented in conventional paging systems. Paging systems are capable of sending and receiving text or numeric messages to users through microwave signal transmission station. Additionally, it is unclear whether the microwave signal transmissions are capable of sending large amounts of data such as high-quality audio and high-resolution graphics in addition to the alphanumeric and text message. For such data to be transferred from one medium to another, substantially large amounts of bandwidth is required. Although some microwave signals, including cellular transmissions, might be capable of transmitting such data, the data transfer rate is relatively slow (approximately 19.2 kilobytes per second) and this is generally set by the FCC as maximum speed limit using cellular transmissions. Microwave signals are also susceptible to dropped connections due to

-5-

variations in signal strength and distance from signal transmission repeaters. Thus, microwave signal data transmissions are susceptible to several problems which may cause data loss and a waste of resources where numerous communications handshake attempts would typically be made to reestablish data connections. Furthermore, a correspondingly large amount of data of data storage space is required to store the large graphics and sound files. Therefore, microwave and other radio frequency based automobile communications systems are subject to the several limitations of radio frequency technology.

SUMMARY OF THE INVENTION

In accordance with the present invention, there is provided a system for delivering a plurality of media messages to the occupants of a vehicle positionable adjacent a commercial establishment. The system is provided with a vehicle interior-attachable transponder programmed with customer identification data. The transponder includes a vehicle occupant-viewable graphical display unit for displaying a plurality of media messages visible to the vehicle occupants. The transponder further includes a transponder system controller for receiving media messages from the commercial establishment and for outputting the media messages to the graphical display unit. The transponder further includes a transponder communications port for creating a datalink between the transponder and the commercial establishment. The system is further provided with a dispensing/billing base system located at the commercial establishment for electrically interrogating the transponder and receiving customer identification data and transponder usage data in response. The base system includes a billing discount unit operative to reduce costs of goods and services based on detected cumulative operating time of the graphical display unit. The base system further includes a base system communications interface for communication with a remotely-located central database server via a remote network. The base system further includes and at least one communications channel board for sending media messages to the transponder.

In accordance with the present invention, there is further provided a method of discounting the cost of goods and services to a customer for accumulated exposure to advertising messages in a vehicle. The method provides for compiling a database of the customers and the respective interests of each customer who purchases goods and

-6-

services from a commercial establishment. The customers are provided with a vehicle transponder unit capable of displaying the media messages and storing transponder usage data. The transponder unit is programmed with customer identification data. The customers are provided with a membership card programmed with customer identification data and capable of marking purchases made by the customer at the commercial establishment. The transponder usage data is measured and recorded.. The transponder unit is electrically interrogated and the customer identification data and the transponder usage data is received via the transponder datalink. The cost of marked purchased made by the customer based on a discount value computed from the transponder unit usage data is reduced. A usage discounted coupon is outputted to the customer for indicating value of discount computed from the transponder usage data. The coupon is redeemed and the cost of goods and services offered by the commercial establishment to the customer based on the value of discount indicated on the coupon is reduced. Finally, the customer is provided with a website account for redeeming the coupon and purchasing discounted goods and services offered on a website.

In accordance with the present invention, there is further provided a method of computing the value of discount allocated to a customer based on accumulated exposure to media messages in a vehicle. A database record is received from a commercial establishment including customer identification data and transponder usage data. The database record is stored in a central database server. The total media message exposure is compiled based on transponder usage data stored in the database record. The current media message exposure computation formula is retrieved. The discount/rebate value is calculated based on the compiled media message exposure using the formula. The database record is updated in the central database server with a computed discount/rebate value. Finally, the discount/rebate value is sent to the customer.

The present invention provides for a system of providing customers with a transponder unit installed in vehicle capable of displaying media messages. The transponder may monitor the usage of the transponder in the form of timing the cumulative exposure to media messages by the vehicle occupants. Alternatively, the transponder may be installed into the vehicle without any cumulative exposure monitoring. Also provided may be an input device for allowing the vehicle occupants to

-7-

make media message inquiries regarding specific products and services displayed on the transponder, and to receive media message responses as a result of the inquiries.

Preferably, the customers drive the vehicle in close proximity to a participating commercial establishment and the transponder then communicates with a base system
5 located at the commercial establishment. Through the use of a communications port disposed on the transponder and a communications port disposed on the base system, the transponder and base system communicate with each other. The communications port on the base system is preferably a plurality of channel boards, each containing a separate communications port. Preferably, the transponder communications port and the channel
10 board communications ports are radio frequency transmitter/receiver ports. The transponder and base system preferably communicate with each other using radio frequencies independent of interaction by a customer.

In addition, the transponder and the graphical display are installed in a vehicle-occupant viewable location of the vehicle. In this location, the media messages are
15 viewable to the vehicle occupants. Alternatively, the transponder and the graphical display may be installed in an external-observer viewable location of the vehicle. In this respect, the media messages are viewable to external observers and not the vehicle occupants. The display unit is preferably attached to the rear window of the vehicle when the display unit is installed in the vehicle to display media messages to the external
20 observers.

Once the transponder and base system establish a datalink, the transponder may send media message inquiries, customer identification data and transponder usage to the base system. In turn, the base system may transmit updated media messages to the transponder. The base system may then periodically connect to a remotely-located central
25 database server to report the information received from the transponders. At the same time, the base system may receive updated media messages to later transmit to the transponders upon establishing a datalink. The server may be connected to a remote network, such as the Internet, and receive the transponder information from a plurality of base systems. In this respect, the server may continually be updated with information
30 received from transponders. At the server, a database server may then compute and allocate a discount/rebate amount to the customers based upon the accumulated media message exposure. Or alternatively, the discount/rebate amount may be computed based

-8-

on installing the transponder in the vehicle without any usage monitoring. Once the discount/rebate amount is calculated, the server may then send media message responses to the customer, issue rebates to the customer and/or discount goods and services from the participating commercial establishments to the customer. Alternatively, a website account may be provided to the customer for purchasing goods and services observed in the transponder, for redeeming discounts/rebates.

BRIEF DESCRIPTION OF THE DRAWINGS

These, as well as other features of the present invention, will become more apparent upon reference to the drawings wherein:

Figure 1 symbolically depicts the communications relationship between the remotely-located central database server, the dispensing/billing base system, and the vehicle transponder unit;

Figure 2 depicts the vehicle positionable adjacent a commercial establishment having the transponder installed in the vehicle with the graphical display unit visible to the vehicle occupants;

Figure 3 depicts the vehicle positionable adjacent a commercial establishment having the transponder installed in the vehicle with the graphical display unit visible to external observers;

Figure 4 depicts a rear view of the vehicle positionable adjacent a commercial establishment having the transponder installed in the vehicle with the graphical display unit visible to external observers;

Figure 5 is a symbolic schematic diagram of the transponder unit;

Figure 6 is a symbolic schematic diagram of the dispensing/billing base system;

Figure 7 is a symbolic schematic diagram of the base system controller disposed in the dispensing/billing base system;

Figure 8 is a symbolic schematic diagram of the channel board controller disposed in a channel board;

Figure 9 is a symbolic schematic diagram of the transmitter/receiver;

Figure 10 is a symbolic flow chart of the steps of the method of the present invention;

Figure 11 is a symbolic flow chart of the steps of the method of the present invention; and

Figure 12 is a symbolic flow chart of the steps of the method of the present invention.

5

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings wherein the showings are for purposes of illustrating a preferred embodiment of the present invention only, and not for purposes of limiting the same, Figures 1-9 illustrate a system for delivering a plurality of media messages to a vehicle 10 positionable adjacent a commercial establishment 12.

Referring now to the symbolic diagram of Figure 1, in accordance with the present invention, there is provided a system for delivering a plurality of media messages to a vehicle 10 positionable adjacent a commercial establishment 18. The system is provided with a vehicle interior-attachable transponder 14. In the preferred embodiment of the present invention, the transponder 14 attached to the interior of the customer's vehicle 10 and includes a graphical display unit 22 and a system board 24. The display 22 graphically displays media messages for the vehicle occupant to observe. The system board 24 contains the circuitry to control the transponder 14 and is preferably programmed with customer identification data. Using customer identification data, each transponder is unique and this allows the dispensing/billing base system 16 to differentiate between other transponders 14. The unique customer identification data is necessary where a plurality of transponders 14. The unique customer identification data is necessary where a plurality of transponders 14 and receiving the customer identification data and transponder usage data in response. The transponder 14 communicates with the base system 16 via a datalink 20 between the transponder 14 and the commercial establishment 18. In the preferred embodiment of the present invention, the datalink 20 is automatically established when the transponder 14 is positioned within close proximity to the base system 16. In this respect, the communications datalink 20 between the transponder and the base system 16 is conducted independent of user interaction. As one of ordinary skill in the art will appreciate, such an automatic communications datalink 20 may be accomplished by using radio frequency

-10-

transmissions. Automatically establishing the datalink 20 is accomplished by continually transmitting a handshake request signal from the base system 16 until a signal is received from the transponder 14 in response. Alternatively, the transponder 14 continually transmits the handshake request signal until a signal is received from the base system 16 in response. Once a handshake request signal is sent and a response is received, the datalink 20 is established and allows for bidirectional data transfers between the transponder 14 and the base system 16. For example, a customer driving a vehicle equipped with the transponder 14 may drive into a commercial establishment 18 equipped with the base system 16 to purchase fuel. The transponder 14 and the base system 16 may then establish a datalink 20 without interaction by the customer.

Preferably, the base system 16 is in communication with a remotely-located central database server 26 via a communication interface 42 connected to a remote network 28. In the preferred embodiment of the present invention, the remote network 28 is the Internet. It is contemplated, however, that the system may operate on a similar type of network which allows customers to access the same information transmitted through the datalink 20. In this respect, all information retrieved from the transponder 14 is reported to the central database server 26 regarding the transponder usage and any other data stored in the transponder such as media message inquiries. In practice, authorized users 30, through user computers 32, may access information stored in the central database server 26 by logging into a website 34 associated with the central database server. The website may provide general information 36 in the form of announcements, special offers, and the procedure for establishing an account. Once an authorized user 30 accesses the website 34, an authorization ID 38 may be entered to verify the identity of the user. The website 34 may then query the central database server 26 to retrieve complete account information for that particular user. Preferably, the central database server 26 provides a plurality of connections such that multiple users may query the central database server simultaneously. In this respect, the central database server 26 stores vital transaction and usage data which may be backed up to a data storage medium 40. Alternatively, the central database server 26 may mirror the contents of the database to another server. In the preferred embodiment of the present invention, one may be able to access information such as the accumulated transponder

-11-

usage data, a value of discount, goods and services associated with the media message inquiries. The central database server 26 may also include an online purchasing system for allowing authorized users 30 to purchase goods and services.

5 The commercial establishment 18 is preferably a fuel service station. However, it is contemplated that the commercial establishment 18 may be any type of business as long as the commercial establishment 18 is cable of being equipped with a dispensing/billing base system 16 and the vehicle 10 may be positioned within communication range of the commercial establishment 18. For example, the commercial establishment may be a food service establishment wherein the transponder 10 14 establishes a datalink with the base system 16 while the vehicle 10 is in close proximity to the food service establishment.

Referring now to Figure 2, in accordance with the present invention, there is provided the transponder 14 having a display unit 22 attached to the vehicle 10 as mentioned above. Preferably, the transponder 14 and the display unit 22 are both 15 contained in a singular unit disposed in a vehicle occupant-viewable location of the vehicle 10. For example, the transponder 14 may be installed in the front dashboard 88 of the vehicle 10 such that a vehicle occupant can observe the display 22. When the transponder 14 comes within close proximity to the commercial establishment 18 equipped with the base system 16, the datalink 20 is established. Preferably, the 20 datalink 20 is established independent of interaction by the vehicle occupant.

Referring now to Figures 3 and 4, the transponder 14 and display unit 22 may be attached to the vehicle 10 in an external observer-viewable location. In this respect, the graphical display 22 faces outward and cannot be observed from an occupant of the vehicle 10. In this position, the graphical display 22 may be observed by an external 25 observer while passing by the vehicle 10. Alternatively, the graphical display unit 22 may be detached from the transponder 14 such that the graphical display unit 22 may be placed in any location of the vehicle 10 and facing any direction while the transponder 14 is located in another location of the vehicle 10. For example, the display unit 22 by itself may be placed in the rear window 86 facing outward as shown 30 in Figures 3 and 4. Or alternatively, both the transponder 14 and the display unit 22 maybe placed in the rear window 86 facing outward as shown in Figures 3 and 4.

-12-

Thus, the detachable graphical display unit 22 may be placed in an external observer-viewable or vehicle occupant-viewable location of the vehicle 10. It is also contemplated that the graphical display unit 22 may be integrated into the rear window 86 of a vehicle 10 as a singular unit.

5 Referring now to the symbolic schematic diagram of Figure 5, in accordance with the present invention, the transponder 14 is further provided with a transponder system controller 46 disposed in the system board 24 for receiving media messages from the commercial establishment 18 and for outputting the media messages to the graphical display unit 22. The system board 24 is manufactured with a material and
10 arrangement as one of ordinary skill in the art will appreciate, such as a multilayer circuit board. Within the system controller 46, a transponder central processing unit (CPU) 50 processes all control messages within the transponder 14. The CPU 50 may be of any CPU known in the art with sufficient processing speed and capacity to control all of the components of the transponder 14.

15 Preferably, a transponder identification EPROM (Erasable Program Read Only Memory) 52 for storing customer identification data is in electrical communication with the CPU 50. In this respect, the CPU 50 reads the data from the EPROM 52 and transmits the data contained in the EPROM to the base system via a transponder communications port 48. Thus, the base system 16 electrically interrogates the
20 transponder 14 and in response, the transponder 14 transmits the customer identification data from the EPROM 52. The EPROM 52 may be programmed during manufacturing with a unique identification number or similar type of identifier sufficient to allow the base system 16 to differentiate between multiple transponders 14. The EPROM 52 may also include data identifying compatible base systems 16. For
25 example, the transponder 14 may receive a handshake request signal from a wireless radio frequency transmitter and in response, the transponder 14 may access the EPROM data to determine if source of transmission is authorized to communicate with the transponder 14. As one of ordinary skill in the art will appreciate, the nature of the EPROM chip 52 allows for the data contained in the EPROM chip 52 to be
30 reprogrammed with the proper EPROM writer. Thus, in the event that the transponder 14 malfunctions or is otherwise incapacitated, the customer identification data may be

-13-

reprogrammed to a new transponder 14 to avoid delay in use. Preferably, the CPU 50 is also in electrical communication with a transponder display interface 54. In this respect, the display interface 54 is also in electrical communication with the display unit 22. A microprocessor dedicated to processing graphics may be embedded within the display interface 54 or alternatively, the display interface 54 may be embedded with the CPU 50. Thus, it is contemplated that the CPU 50 may provide graphics processing capabilities in addition to the primary function of controlling the transponder 14. The CPU 50 is preferably coupled with at least one transponder program/data random-access-memory chip (RAM) 56 for storing and retrieving program instructions and at least one transponder program read-only-memory chip (ROM) 58 for storing program instructions. Preferably, the ROM 58 is of sufficient capacity to store the pre-programmed instructions for operating the transponder. For example, the ROM 58 may be programmed with instructions which determine the frequency and duration of each media message displayed on the display unit 22. Thus, the ROM 58 stores program instructions to be read from the CPU 50. Preferably, the RAM 56 is constructed with sufficient capacity to execute the program instructions stored in the ROM 58 and to store transponder usage data. In addition, the display interface 54 may utilize the RAM 56 to output graphics to the display unit 22 where the display interface 54 is configured to operate dependent on system memory rather than operating independently of system memory. Thus, the RAM 56 is preferably a high capacity memory chip such as memory chips commonly used in personal computers.

The transponder 14 is further provided with a transponder communications port 48 in electrical communication with a transponder communications controller 76. The communications controller 76 is in electrical communication with the CPU 50 and provides the circuitry to control the communications port 48. In the preferred embodiment of the present invention, the transponder communications port 48 is a wireless radio frequency transmitter/receiver configured to communicate with a plurality of base systems 16. It is contemplated however that the communications port 48 may be any type of communications port including wired communications ports so long as the port provides sufficient bandwidth to transfer the media messages and its associated data. For example, a NIC (Network Interface Card) port may be used such

-14-

the networking ports used in standard PCs and networks. Typical NIC ports may be 10-base-T, 10-base-2, and 100-base-T ports which use twisted pair or single stranded networking cable with bandwidths ranging from 10 megabits per second to 100 megabits per second.

5 Preferably, the graphical display unit 22 is in electrical communication with the display interface 54. The display 22 may be manufactured as a LCD (Liquid Crystal Display) or other similar type of display capable of displaying both text and graphics. Preferably, the display 22 is visible to the occupant of the vehicle during day and night. Thus, a backlit display LCD display or active-matrix type display used in portable
10 laptop computers may be utilized. Thus, the type of display is not crucial, as long as the display is capable of displaying both text 82 and graphics 84. It is contemplated that the size and thickness of the display 22 may vary. However, the size and thickness of the display 22 is not crucial, as long as the display is capable of displaying both text 82 and graphics 84. In addition, the display 22 may be detachable from the
15 transponder 14 for placement is a separate location from the transponder 14. In this respect, the detachable display 22 may be in communication with the transponder 14 via an electrical connection between the display interface 54 and the display 22. The graphical display 22 may also provide a transponder usage indicator for displaying accumulated exposure to the media messages. By using a timer unit 60 to measure the
20 accumulated transponder usage, the transponder 14 may then display the amount of usage measured by the transponder 14.

 In the preferred embodiment of the present invention, a timer unit 60 for measuring accumulated exposure to media messages by the vehicle occupant is provided in the system controller 46. It is contemplated that the timer unit 60 is in
25 electrical communication with the CPU 50 and the display unit 22 for the purpose of measuring the total operating time of the display. Advantageously, the timer unit 60 allows usage information to be written in the transponder 14 and then subsequently transmitted to the base system 16 via the datalink 20 when the transponder 14 is positioned adjacent a commercial establishment 18. Based on the data created by the
30 timer unit 60, customers may then receive a discount on goods and services.

An auxiliary port 62 may be provided for connecting external communications devices 68, such as mobile phones, to the transponder unit 14. In this respect, the auxiliary port 62 may be a RGB (Red Green Blue) or a SVHS (Super VHS) composite video input jack commonly used by many home electronics and portable electronics for outputting a video signal to an external display unit. For example, home game console units, video cameras, and video tape recorders typically use composite video output jacks to interface with televisions and other video signal receivers. Alternatively, the auxiliary port 62 may be a computer video input jack configured to accept a video signal outputted by home computers, laptop computers and similarly configured devices which utilize a VGA adaptor (Video Graphics Array) for outputting a video signal. In the preferred embodiment of the present invention, the auxiliary port 62 is configured to accept a video signal from a personal communications device such as a portable electronic organizer, cellular phone, or pager. When connecting such a personal communications device to the auxiliary port 62 of the transponder unit 14, the display unit 22 displays substantially the same content as the display of the communications device. For example, a user may have difficulty reading the small display of a cellular phone and to make reading easier, the user may attach the cellular phone to the auxiliary port 62 of the transponder unit 14. When the external communications device is attached to the transponder unit, the video signal received from the communications device may occupy the entire viewable area of the display unit or may be configured to display both the media messages and the external video signal.

An expansion port 64 may also be provided for electrically connecting a plurality of extended feature modules 66, such as memory chips. In this respect, the expansion serves as a multifunction port allowing for upgradability of the transponder 14. For example, extended feature modules may be provided which attach to the transponder 14 via the expansion port 64. Such extended features may include higher capacity memory, a second display unit for placement in another location of the vehicle, or an additional communications port. Advantageously, the expansion port 64 also provides for more simplified upgrades since any extended features not now developed, may be added to the unit without the need for redesigning the entire transponder unit 14.

-16-

A sound interface 80 in electrical communication with a vehicle occupant-accessible sound emission mechanism 70 may be provided for presenting audible media messages to the vehicle occupants. It is contemplated that the media messages stored in the transponder 14 may have audible messages in addition to graphic messages. Thus, a sound interface 80 in electrical communication with the CPU 50 allows for the media messages to be heard by the vehicle occupant. The sound interface 80 is in turn connected to the sound emission mechanism 70. The sound emission mechanism is preferably a speaker 72 disposed on the transponder 14 but may also be a connection to the existing vehicle sound system for allowing the audible messages to be heard through the existing vehicle sound system.

A vehicle occupant-selectable input device 74 disposed in a vehicle occupant-accessible location of the vehicle 10 may also be provided by the transponder 14. The input device 74 marks vehicle occupant-selected media message inquiries in the transponder 14 and stores the mark as transponder usage data in a data storage medium in the transponder 14, preferably the RAM 56. Preferably, the input device 74 is a wireless remote control device configured to transmit the media message inquiry signal to the transponder 14. The transponder 14 stores the media message inquiry signal as transponder usage data in the response to receipt of the media message inquiry signal. The input device 74 may include a single button or a plurality of buttons as long as the input device 74 transmits the proper media message inquiry signal to the transponder 14.

In the preferred embodiment of the present invention, a transponder power supply 78 is provided in electrical communication with all components disposed in the transponder 14. The power supply 78 is preferably an AC/DC power converter capable of converting the AC power source from a vehicle to the DC power lead for the transponder 14. Or alternatively, the power supply 78 may be a self-sustaining power source disposed in the transponder 14. For example, the power supply 78 may be a high capacity battery with sufficient power to operate the transponder.

Referring now to the symbolic schematic diagram of Figure 6, there is provided a dispensing/billing base system 16 for electrically interrogating the transponder 14 and receiving customer identification data and transponder usage data in response.

-17-

Preferably, the base system 16 is disposed in a location of the commercial establishment 18 such that vehicles 10 are positionable in close proximity to the base system 16 to establish a datalink 20 between the transponder 14 and the base system 16. In the preferred embodiment of the present invention, the base system 16 includes a base system controller 90 for controlling the components of the base system 16. The base system controller 90 is manufactured with a material and arrangement as one of the ordinary skill in the art will appreciate, such as a multilayer circuit board. In electrical communication with the base system controller 90 is a base system communications interface 42 for communicating with the remotely-located central database server 26 via the remote network 28. Preferably, the communications interface 42 is a modem device, as one of ordinary skill in the art will appreciate. In this respect, the communications interface 42 allows the base system 16 to connect to the remote network 28 and the central database server 26 to report stored customer identification data and the corresponding transponder usage data while receiving media messages from the central database server 26 via the remote network 28. Advantageously, this data transfer allows the central database server 26 to store all data received from the transponder 14 in a central location. For example, the base system 16 may be programmed to periodically connect to the central database server 26 and conduct data transfers. It is contemplated that a high speed/high bandwidth communications interface may be utilized as the communications interface 42 as the size of media messages and data packets transferred increases. For example, the communications interface 42 may be a constant direct link to the Internet such as a digital T1 connection.

Preferably, the base system controller 90 is in electrical communication with a billing discount unit 92 operative to reduce cost of goods and services based on detected cumulative operating time of the graphic display unit 22. The billing discount unit 92 may be a membership card reader for receiving customer identification data stored on a membership card and for marking purchases made by customers at the commercial establishment 18 to be discounted. In this respect, the billing discount unit 92 may include a magnetic stripe reader as one of ordinary skill in the art will appreciate. For example, a customer provided with a membership card may drive to

-18-

the commercial establishment 18 and present the membership card to the commercial establishment 18. The membership card may then be swiped through the billing discount unit 92 before the customer makes a purchase at the commercial establishment 18. By swiping the membership card through the billing discount unit 92, the purchases made by the customer are marked as purchases which qualify for a discount, reduction in price or rebate. The customer identification data may be read by the billing discount unit 92 from the membership card and subsequently transferred to the base system controller 90. The customer purchase date may then be transferred to the central database server 26 via the remote network 28. Alternatively, the billing discount unit may transfer the customer identification data and the purchase data to the base system controller 90 which may then subsequently be transferred to a host computer from the host interface 104 disposed in the base system controller 90 as shown in Figure 7.

In the alternative, the billing discount unit 92 is a usage receipt output device in electrical communication with a printing output device 94 for computing discounted value data and for creating a receipt indicating discounted value data. In this respect, the billing discount unit 92 reduces the cost of goods and services and sends the information to a usage receipt output device such as a printer 94.

Preferably, at least one communications channel board 102 for sending media messages to the transponder 14 is provided in electrical communication with the base system controller 90. The channel board 102 provides a channel board controller 96 and a channel board communications port 98. In the preferred embodiment of the present invention, the channel board communications port 98 is a wireless radio frequency transmitter/receiver configured to communicate with a plurality of transponders 14. It is contemplated however that the communications port 98 may be any type of communications port including wired communications ports so long as the port provides sufficient bandwidth to transfer the media messages and its associated data. For example, a NIC (Network Interface Card) port may be used such as networking ports used in standard PCs and networks. Typical NIC ports may be 10-base-T, 10-base-2, and 100-base-T ports which use twisted pair or single stranded networking cable with bandwidths ranging from 10 megabits per second to 100

megabits per second. Thus, in all embodiments of the invention, the communications port 98 is configured to communicate with the transponder 14. Moreover, it is preferred that a plurality of channel boards be in electrical communication with the base system controller 90. In a configuration with a plurality of channel boards 102, each channel board 102 may transmit/receive at a different frequency, or alternatively, each channel board 102 may transmit/receive at the same frequency as one another. It is contemplated that each channel board 102 may communicate with a different transponder 14. Or alternatively, each channel board may be dedicated to a specific type of transmission. For example, one channel board 102 may be dedicated to transmitting data only whereas another channel board 102 may be dedicated to receiving only.

In the preferred embodiment of the present invention, a base system power supply 100 is provided in electrical communication with all components disposed in the base system 16. The power supply 100 is preferably in DC/DC power converter capable of converting the AC power source from a vehicle to the AC power lead for the base system 16.

Referring now to symbolic schematic diagram of Figure 7, a base system controller 90 is provided disposed in the base system 16. Preferably, the base system controller 90 is provided with a CPU 106 for controlling the components of the base system controller 90. The CPU 106 may be of a similar type utilized as the transponder CPU 50. Preferably, the CPU 106 is in electrical communication with at least one base system program read-only-memory (ROM) 108 for storing program instructions in a similar configuration as the transponder ROM 58. In this respect the ROM 108 is operative to store the program instructions which is read by the CPU 106 to control the base system 16. In addition, at least one base system program/data random-access-memory (RAM) 110 for storing and retrieving program instructions and generated is provided in a similar configuration as the transponder RAM 56. In this respect, the CPU 106 reads the program instructions from the ROM 108 and executes the instructions using the RAM 110. In addition, the RAM 110 may be used to store data such as received transponder usage data and customer identification data.

Alternatively, the RAM 110 may function solely as a program execution RAM while a separate data RAM 112 may be used to store generated data and/or received data.

In the preferred embodiment of the present invention, the base system controller 90 is provided with a plurality of channel card controllers 114 for interfacing with the channel board controllers 96. The channel card controllers 114 provide a communications interface for allowing the base system CPU 106 to communicate with the channel board controllers 96. As mentioned above, a plurality of channel boards 102 preferably communicate with a plurality of transponders 14. Thus, each channel card controller 114 communicates with a corresponding channel board controller 96.

Referring now to the symbolic schematic diagram of Figure 8, a channel board controller 96 is provided having a channel board CPU 116 having a similar configuration with the transponder CPU 50 and the base controller CPU 106. Thus, the channel board CPU 116, the transponder CPU 50 and the base controller CPU 106 may use the same type of microprocessor for controlling their respective components. Preferably, the CPU 116 is in electrical communication with at least one channel board program read-only-memory (ROM) 120 for storing program instructions in a similar configuration as the transponder ROM 58 and the base system ROM 108. In this respect the ROM 118 is operative to store the program instructions which is read by the CPU 116 to control the channel board 102. In addition, at least one channel board system program/data random-access-memory (RAM) 122 for storing and retrieving program instructions and generated is provided in a similar configuration as the transponder RAM 56 and the base system RAM 110. In this respect, the CPU 116 reads the program instructions from the ROM 120 and executes the instructions using the RAM 122. In addition, the RAM 122 may be used to store data such as received transponder usage data and customer identification data. Alternatively, the RAM 122 may function solely as a program execution RAM while a separate data RAM 124 may be used to store generated data and/or received data. In addition, a channel board communications controller interface 118 is provided for communicating with the base system controller 90. Specifically, the controller interface 118 communicates with a corresponding channel card controller 114 disposed on the base system controller 90. A channel board communications controller 126 is also provided in the channel board

controller 96 such that the communications controller 126 is in communication with a channel board communications port 98 as shown in Figures 6 and 8. Preferably, the communications controller 126 is a radio frequency wireless interface configured to communicate with a radio frequency wireless transmitter/receiver. For example, a transponder 14 in close proximity with the base system 14 may be interrogated by the channel board communications port 98 through a radio frequency controlled by the channel board communications controller 126 in the form of a radio frequency interface driven by the channel board CPU 116 disposed in the channel board controller 96.

Referring now to the symbolic schematic diagram of Figure 9, a transmitter/receiver is provided which may be utilized as the transponder communications port 48 and the channel board communications port 98. The transmitter/receiver is known to one of ordinary skill in the art and contains associated components and circuitry for both simultaneously transmitting and receiving data through radio frequencies.

Referring now to the flow chart of Figures 10 and 11, a method of discounting the cost of goods and services to a customer for accumulated exposure to media messages in a vehicle is provided. Preferably, a central database server 128 is provided for storing media messages 134. Media messages stored on the central database server 128 are sent to the commercial establishment 130 and in turn, the media messages are transmitted to the vehicle 132. Within the vehicle 132, the further steps are provided of storing media messages, monitoring media message exposure and storing media message inquiries 138 which in turn is sent to the commercial establishment 130. Within the commercial establishment, the media message exposure and media message inquiries are transmitted 140 to the server 128. Preferably, the server then computes and allocates a discount/rebate from media message exposure. It is contemplated that the server may implement a database server software for processing the data. Preferably, the database server 128 may receive a database record including customer identification data and transponder usage data from the commercial establishment 150, then store the database record in the central database 152, then compile the total media message exposure based on transponder usage data 154, then retrieve the current media message exposure computation formula 156, then calculate

-22-

the discount/rebate value based on the media message exposure using the formula 158, then update the database record in the central database server with computed discount/rebate value 160 and finally send the computed discount/rebate to the customer 162.

5 Additional modifications and improvements of the present invention may also be apparent to those of ordinary skill in the art. Thus, the particular combination of parts described and illustrated herein are not intended to serve as limitations of alternative devices within the spirit and scope of the invention.

WHAT IS CLAIMED IS:

1. A system for delivering a plurality of media messages to the occupants of a vehicle positionable adjacent a commercial establishment, the system comprising:

5 a) a vehicle interior-attachable transponder programmed with customer identification data, the transponder including:

i) a vehicle occupant-viewable graphical display unit for displaying a plurality of media messages visible to the vehicle occupants;

10 ii) a transponder system controller for receiving media messages from the commercial establishment and for outputting the media messages to the graphical display unit;

iii) a timer unit for measuring accumulated exposure to media messages by the vehicle occupant;

15 iv) a transponder communications port for creating a datalink between the transponder and the commercial establishment; and

b) a dispensing/billing base system located at the commercial establishment for electrically interrogating the transponder and receiving customer identification data and transponder usage data in response, the base system having a billing discount unit operative to reduce cost of goods and services based on detected cumulative operating time of the graphical display unit, a base system controller for controlling components of the base system, a base system communications interface for communicating with remotely-located central database server via a remote network, and at least one communications channel board for sending media messages to the transponder.

25 2. A system according to Claim 1, wherein the transponder system controller comprises a transponder CPI in electrical communication with:

a) at least one transponder program read-only-memory chip for storing program instructions;

30 b) at least one transponder program/data random-access-memory chip for storing and retrieving program instructions and generated data;

c) a transponder identification EPROM chip for storing the customer identification data;

-24-

d) a transponder graphical display controller for generating video graphics on the graphical display unit; and

e) a transponder communications controller for processing transmit and receive signals to and from the transponder communications port.

5 3. A system according to Claim 1, wherein the transponder communications port is a device selected from the group consisting of a wireless radio frequency device selected from the group consisting of a wireless radio frequency transmitter/receiver port, an infrared port, a fiber optic port, a serial port, a parallel port, a USB (Universal Serial Bus) port, a NIC (Network Interface Card) port, a fibre channel port, a SCSI (Small Computer Systems Interface) port and any combination thereof in electrical
10 communication with the transponder communications controller.

4. A system according to Claim 1, wherein the graphical display unit is an illuminated liquid crystal display panel in electrical communication with the transponder graphical display interface.

15 5. A system according to Claim 1, wherein the graphical display unit is configured to detach from the transponder and operate in an external observer-viewable location of the vehicle being operative to deliver the media messages to external observers.

6. A system according to Claim 1, wherein the graphical display unit
20 comprises a transponder usage indicator for displaying accumulated exposure to media messages.

7. A system according to Claim 1, wherein the transponder further comprises a sound interface in electrical communication with a vehicle occupant-accessible sound emission mechanism for presenting audible media messages to the vehicle occupants.

25 8. A system according to Claim 7, wherein the sound emission mechanism is a speaker.

9. A system according to Claim 1, wherein the base system controller comprises a base system CPU in electrical communication with:

30 a) at least one base system program read-only-memory for storing program instructions;

b) at least one base system program/data random-access-memory for storing and retrieving program instructions and generated data; and

c) a plurality of channel card controllers for interfacing with a plurality of channel board controllers.

10. A system according to Claim 1, wherein each of the channel boards comprises a channel board CPU in electrical communication with:

5 a) at least one channel board read-only-memory for storing program instructions;

b) at least one channel board random-access-memory for storing and retrieving program instructions and generated data;

10 c) a channel board controller interface for communicating with the channel card controller disposed on base system controller;

d) a channel board communications controller for processing transmit and receive signals to and from the transponder communications port; and

e) a channel board communications port for creating a datalink between the transponder and the commercial establishment.

15 11. A system according to Claim 1, wherein the channel board communications port is a device selected from the group consisting of a wireless radio frequency transmitter/receiver port, an infrared port, a fiber optic port, a serial port, a parallel port, a USB (Universal Serial Bus) Port, an NIC (Network Interface Card) port, a fibre channel port, a SCSI (Small Computer Systems Interface) port and any
20 combination thereof in electrical communication with the channel board communications controller.

12. A system according to Claim 1 further comprising one channel board in electrical communication with the base system controller, wherein the channel board electrically interrogates a plurality of transponder unites.

25 13. A system according to Claim 1 further comprising a plurality of channel boards in electrical communication with the base system controller, wherein each channel board electrically interrogates a corresponding transponder unite.

14. A system according to Claim 1, wherein the datalink between the transponder and the commercial establishment is conducted independent of interaction
30 by the vehicle occupant.

15. A system according to Claim 1, wherein the billing discount unit is a membership card reader for receiving customer identification data stored on a

membership card and for making purchases made by customers at the commercial establishment to be discounted.

5 16. A system according to Claim 15, wherein the membership card is a credit card having customer identification data stored on a magnetic data storage region disposed therein.

 17. A system according to Claim 15, wherein the membership card is a data storage device having customer identification data stored on an optical data storage region disposed therein.

10 18. A system according to Claim 1, wherein the billing discount unit is a usage receipt output device in electrical communication with a printing output device for computing discounted value data and for creating a receipt indicating discounted value data.

15 19. A system according to Claim 1 further comprising a vehicle occupant-selectable input device disposed in a vehicle occupant-accessible location of the vehicle, the input device being operative to mark vehicle occupant-selected media message inquiries in the transponder and to store the mark as transponder usage data in the transponder.

20 20. A system according to Claim 19, wherein the input device is a wireless remote control device configured to transmit the media message inquiry signal to the transponder, the transponder stores the media message inquiry signal as transponder usage data in response to receipt of the media message inquiry signal.

 21. A system according to Claim 1 further comprising a host interface disposed in the base system controller for communicating with a host computer.

25 22. A system according to Claim 1 further comprising a remotely-located central database server in communication with the dispensing/billing base system via a remote network.

 23. A system according to Claim 22, wherein the remote network is Internet and the central database server is configured to communicate with a plurality of base systems and a plurality of authorized users simultaneously via the Internet.

30 24. A system according to Claim 1 wherein the base system communications interface is a modem device for interfacing the base system with the remotely-located

central database server via the remote network, the central database server being operative to store transponder usage data and customer identification data.

25. A system according to Claim 1, wherein the transponder further comprises an expansion port for electrically connecting a plurality of extended feature modules.

5 26. A system according to Claim 1, wherein the transponder further comprises an input auxiliary port for receiving electrical output signals from external communication devices, the auxiliary port being operative to relay the composite output signals to the graphical display unit.

27. A system according to Claim 26, wherein the communication devices are
10 devices selected from the group consisting of Personal Digital Assistants, Mobile Telephones, Pagers, and Mobile Computers.

28. A system according to Claim 1 wherein the remotely-located central database server further comprises a user account server having being operative to provide authorized users with account information and purchase goods and services.

15 29. A system according to Claim 1, wherein the commercial establishment is a fuel service station.

30. A system according to Claim 29, wherein the dispensing/billing base system is a pump control mechanism configured to exchange data with the transponder.

20 31. A system according to Claim 1, wherein the commercial establishment is a food service establishment.

32. A system according to Claim 31, wherein the dispensing/billing base system is a food service billing control mechanism configured to exchange data with the transponder.

25 33. A system for delivering a plurality of media messages to the occupants of a vehicle positionable adjacent a commercial establishment, the system comprising:

a) a plurality of vehicle interior-attachable transponders programmed with customer identification data, each transponder including:

i) a vehicle occupant-viewable graphical display unit for displaying a plurality of media messages visible to the vehicle occupants,

30 ii) a transponder system controller for receiving media messages from the commercial establishment and for outputting the media messages to the graphical display unit,

-28-

iii) a timer unit for measuring accumulated exposure to media messages by the vehicle occupant,

iv) a transponder communications port for creating a datalink between the transponder and the commercial establishment; and

5 b) a plurality of dispensing/billing base systems located at the commercial establishment for electrically interrogating the transponder and receiving customer identification data and transponder usage data in response, each base system including a billing discount unit operative to reduce cost of goods and services based on detected cumulative operating time of the graphical
10 display unit, a base system controller for controlling components of the base system, a base system communications interface for communicating with a remotely-located central database server via a remote network, and at least one communications channel board for sending media messages to the transponder;

15 c) a remotely-located central database server in communication with the dispensing/billing base system via a remote network.

34. a system for delivering a plurality of media messages to the occupants of a vehicle positionable adjacent a commercial establishment, the system comprising:

a) a vehicle interior-attachable transponder programmed with customer identification data, the transponder including:

20 i) a vehicle occupant-viewable graphical display unit for displaying a plurality of media messages visible to the vehicle occupants,

ii) a transponder system controller for receiving media messages from the commercial establishment and for outputting the media messages to the graphical display unit,

25 iii) a transponder communications port for creating a datalink between the transponder and the commercial establishment; and

b) a dispensing/billing base system located at the commercial establishment for electrically interrogating the transponder and receiving customer identification data and transponder usage data in response, the base
30 system including a billing discount unit operative to reduce cost of goods and services based on detected presence of transponder, a base system controller for controlling components of the base system, a base system communications

-29-

interface for communicating with a remotely-located central database server via a remote network, and at least one communications channel board for sending media messages to the transponder.

5 35. A system for delivering a plurality of media messages to external observers of a vehicle positionable adjacent a commercial establishment, the system comprising:

a) a vehicle interior-attachable transponder programmed with customer identification data, the transponder including:

10 i) an external observer-viable graphical display unit for displaying a plurality of media messages visible to an external observer,

ii) a transponder system controller for receiving media messages from the commercial establishment and for outputting the media messages to the graphical display unit,

15 iii) a transponder communications port for creating a datalink between the transponder and the commercial establishment; and

b) a dispensing/billing base system located at the commercial establishment for electrically interrogating the transponder and receiving customer identification data and transponder usage data in response, the base system including a billing discount unit operative to reduce cost of goods and services based on detected presence of the transponder, a base system controller for controlling components of the base system, a base system communications interface for communicating with a remotely-located central database server via a remote network, and at least one communications channel board for sending media messages to the transponder.

20

25 36. A method of discounting the cost of goods and services to a customer for accumulated exposure to media messages in a vehicle, said method comprising the steps of:

a) compiling a database of the customers and the respective interests of each customer who purchases goods and services from a commercial establishment;

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-30-

b) providing the customers with a vehicle transponder unit capable of displaying the media messages and storing transponder usage data, the transponder unit being programmed with customer identification data;

c) measuring and recording the transponder usage data;

5 d) electrically interrogating the transponder unit and receiving the customer identification data and the transponder usage data via the transponder datalink;

e) reducing the cost of goods and services to the customer based on a discount value computed from the transponder unit usage data.

10 37. The method of Claim 36, wherein step (a) the database is compiled by:

1) identifying potential products and services of interest for each customer;

2) generating a database of records for each customer, the records having contact information and the list of interests for each of the customers; and

15 3) assigning a unique customer identifier tag for each of the customers and records generated in the database.

38. The method of Claim 36, wherein the commercial establishment is a fuel service station.

20 39. The method of Claim 36, wherein the commercial establishment is a food service establishment.

40. The method of Claim 36, wherein the transponder unit is provided to the customers at no cost.

41. The method of Claim 36, wherein the media messages are selectively transmitted to the transponder based on the interests of the customer.

25 42. The method of Claim 36, wherein the transponder usage data includes timer data recorded from measuring accumulated exposure to the media messages of the customer.

43. The method of Claim 42, wherein the transponder usage data further includes media messages inquiries recorded by the customer.

30 44. The method of Claim 43, wherein step (c) further comprises the steps of:

1) recording media message inquiries in the transponder unit;

2) forwarding the media message inquiries to the corresponding sponsors of the media messages selected by the customer.

45. The method of Claim 42, wherein step (c) further comprises the step of recording the accumulated exposure to the media messages displayed by the transponder unit.

46. The method of Claim 36, wherein step (d) further comprises the steps of:

1) positioning the transponder unit adjacent a dispensing/billing base system located at a commercial establishment;

2) establishing a transponder datalink between the transponder unit and the base system; and

3) sending media messages to the transponder via the transponder datalink.

47. The method of Claim 36, wherein step (e) further comprises the steps of:

1) establishing a network datalink via a communications interface between the base system and a remotely-located central database; and

2) transmitting base system data to the central database and receiving media messages via the network datalink.

48. The method of Claim 36, wherein step (e) further comprises the step of assigning the discount value based on a cost per duration of accumulated media message exposure.

49. The method of Claim 36 further comprising the step of:

f) outputting a usage discounted coupon to the customer for indicating the discount value computed from the transponder usage data.

50. The method of Claim 49 further comprising the step of:

g) redeeming the coupon and reducing the cost of goods and services offered by the commercial establishment to the customer based on the discount value indicated on the coupon.

51. The method of Claim 49 further comprising the step of:

h) providing the customer with a website account for redeeming the coupon and purchasing discounted goods and services offered on a website.

52. A method of discounting the cost of goods and services to a customer for installing a transponder unit in a vehicle, said method comprising the steps of:

-32-

a) compiling a database of the customers and the respective interests of each customer who purchases goods and services from a commercial establishment;

5 b) providing the customers with a vehicle transponder unit capable of displaying the media messages, the transponder unit being programmed with customer identification data;

c) electrically interrogating the transponder unit and receiving the customer identification data via the transponder datalink; and

10 d) reducing the cost of goods and services to the customer based on a discount value computed from the transponder unit usage data.

53. A method of discounting the cost of goods and services to a customer for accumulated exposure to advertising messages in a vehicle, said method comprising the steps of:

15 a) compiling a database of the customers and the respective interests of each customer who purchases goods and services from a commercial establishment;

b) providing the customers with a vehicle transponder unit capable of displaying the media messages and storing transponder usage data, the transponder unit being programmed with customer identification data;

20 c) measuring and recording the transponder usage data;

d) electrically interrogating the transponder unit and receiving the customer identification data and the transponder usage data via the transponder datalink;

25 e) reducing the cost of goods and services to the customer based on a discount value computed from the transponder unit usage date;

f) outputting a usage discounted coupon to the customer for indicating value of discount computed from the transponder usage data;

30 g) redeeming the coupon and reducing the cost of goods and services offered by the commercial establishment to the customer based on the value of the discount indicated on the coupon; and

h) providing the customer with a website account for redeeming the coupon and purchasing discounted goods and services offered on a website.

54. A method of discounting the cost of goods and services to a customer for accumulated exposure to media messages in a vehicle, said method comprising the steps of:

- 5 a) compiling a database of the customers and the respective interests of each customer who purchases goods and services from a commercial establishment;
- b) providing the customers with a vehicle transponder unit capable of displaying the media messages and storing transponder usage data, the transponder unit being programmed with customer identification data;
- 10 c) providing the customers with a membership card programmed with customer identification data and capable of marking purchases made by the customer at the commercial establishment;
- d) measuring and recording the transponder usage data;
- e) electrically interrogating the transponder unit and receiving the
15 customer identification data and the transponder usage data via the transponder datalink;
- f) reducing the cost of marked purchases made by the customer based on a discount value computed from the transponder unit usage data.

55. The method of Claim 54 further comprising the steps of:

- 20 g) outputting a usage discounted coupon to the customer for indicating value of discount computed from the transponder usage data;
- h) redeeming the coupon and reducing the cost of goods and services offered by the commercial establishment to the customer based on the value of discount indicated on the coupon; and
- 25 i) providing the customer with a website account for redeeming the coupon and purchasing discounted goods and services offered on a website.

56. A method of computing the value of discount allocated to a customer based on accumulated exposure to media messages in a vehicle, said method comprising the steps of:

- 30 a) receiving a database record from a commercial establishment including customer identification data and transponder usage data;
- b) storing the database record in a central database server;

-34-

- 5
- c) compiling total media message exposure based on transponder usage data stored in the database record;
 - d) retrieving a current media message exposure computation formula;
 - e) calculating discount/rebate value based on the compiled media message exposure using the formula;
 - f) updating the database record in the central database server with a computed discount/rebate value; and
 - g) sending the discount/rebate value to the customer.

1/10

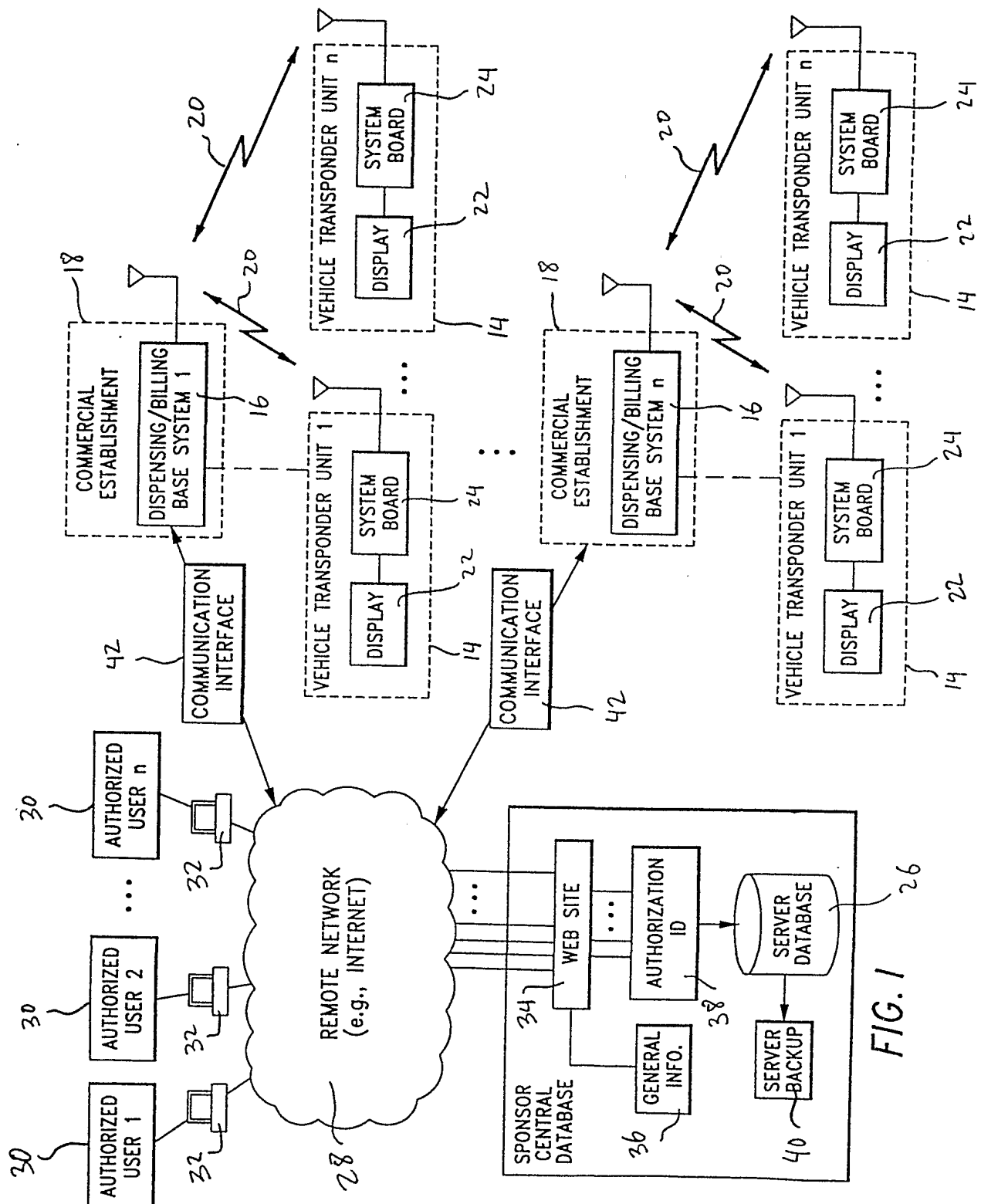


FIG. 2

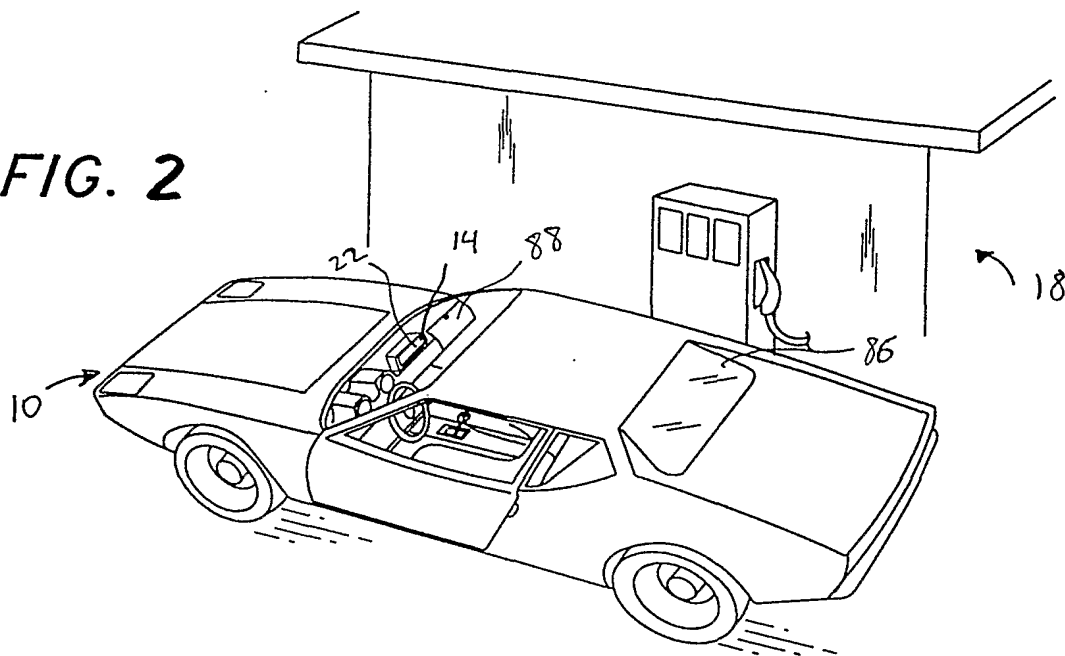


FIG. 3

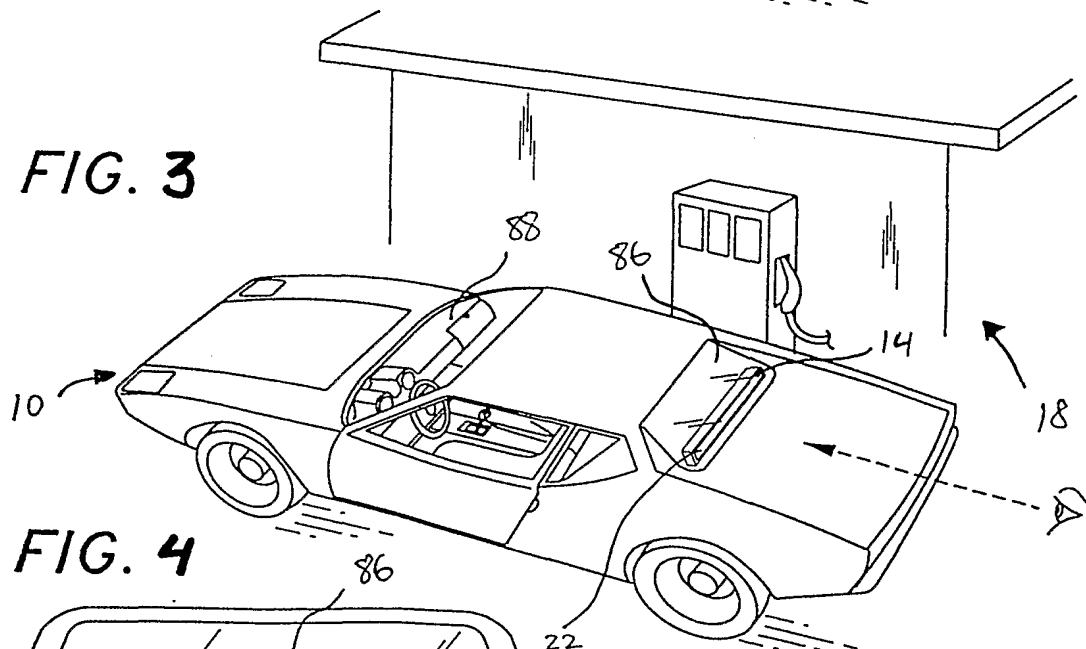
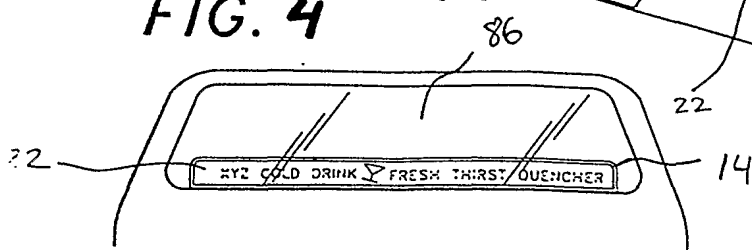


FIG. 4



3/10

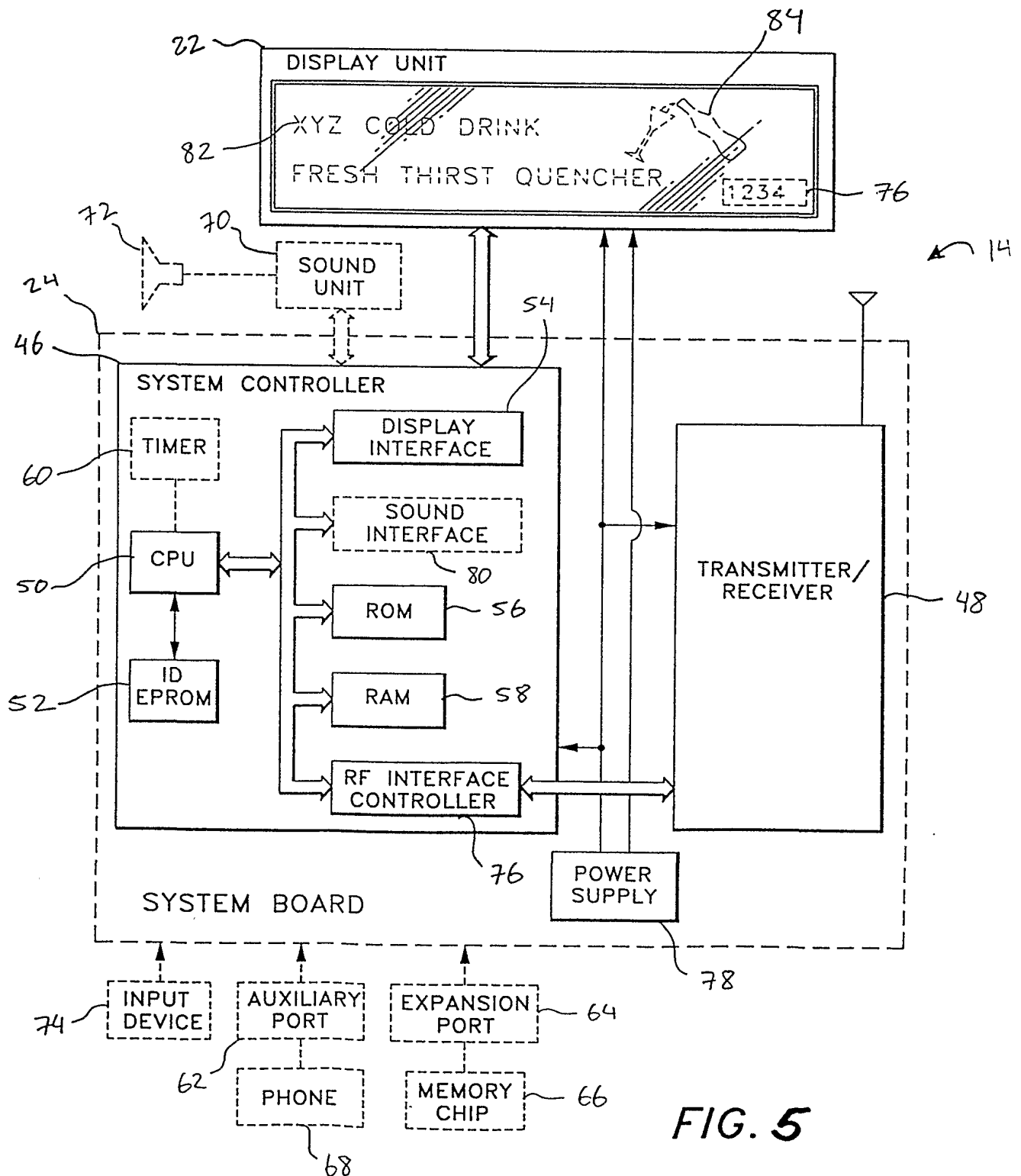
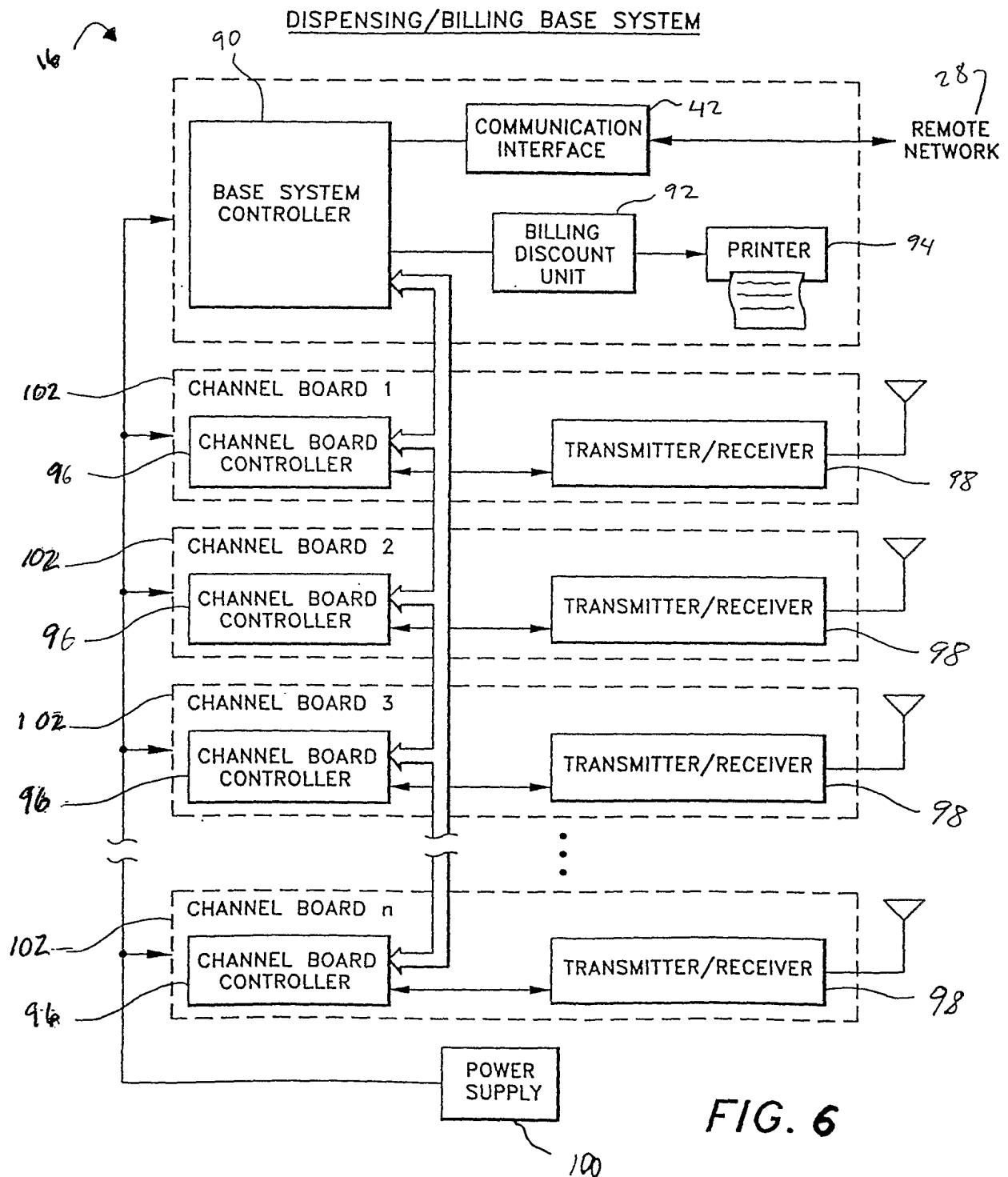
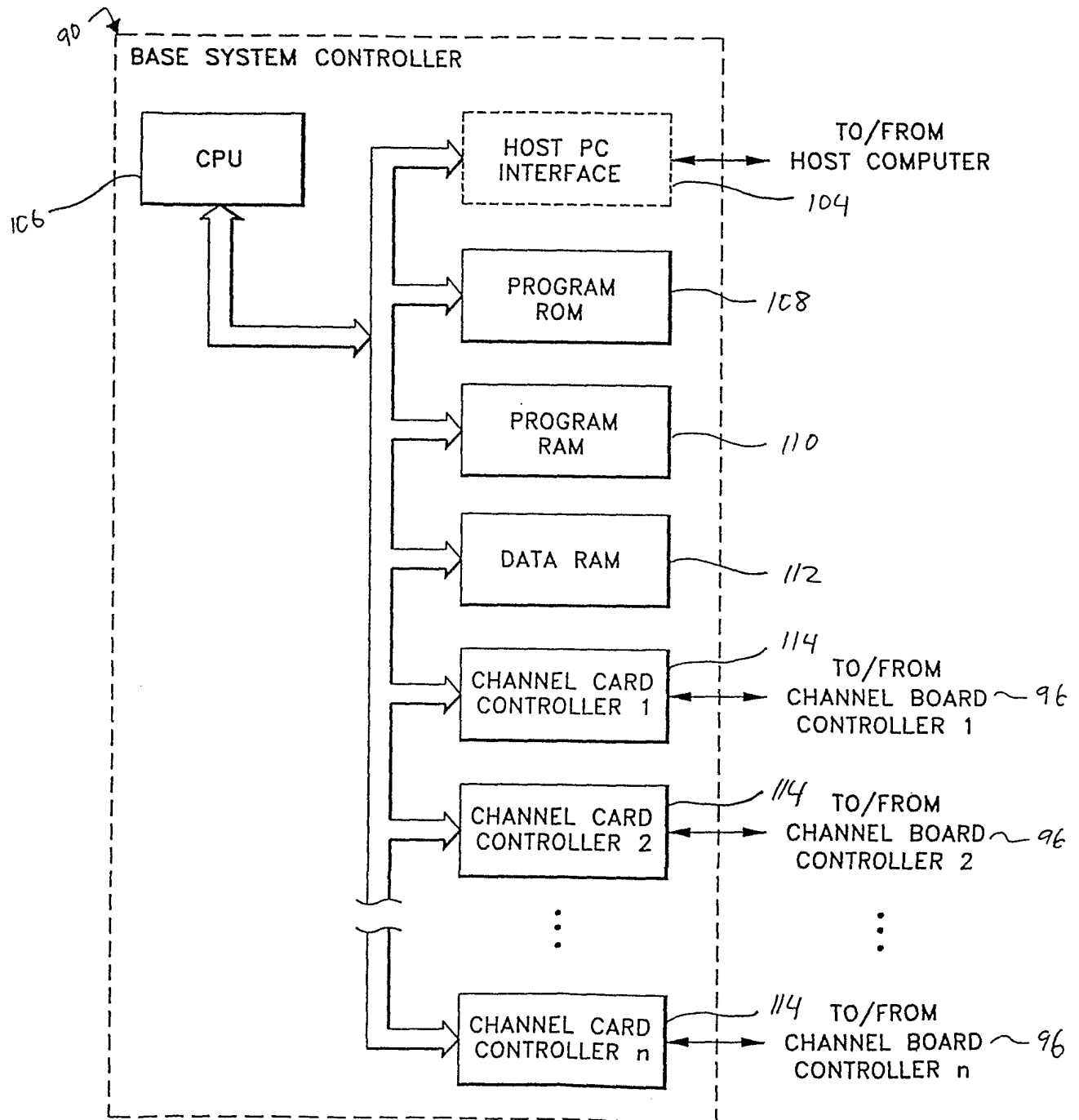


FIG. 5

4/10



5/10



6/10

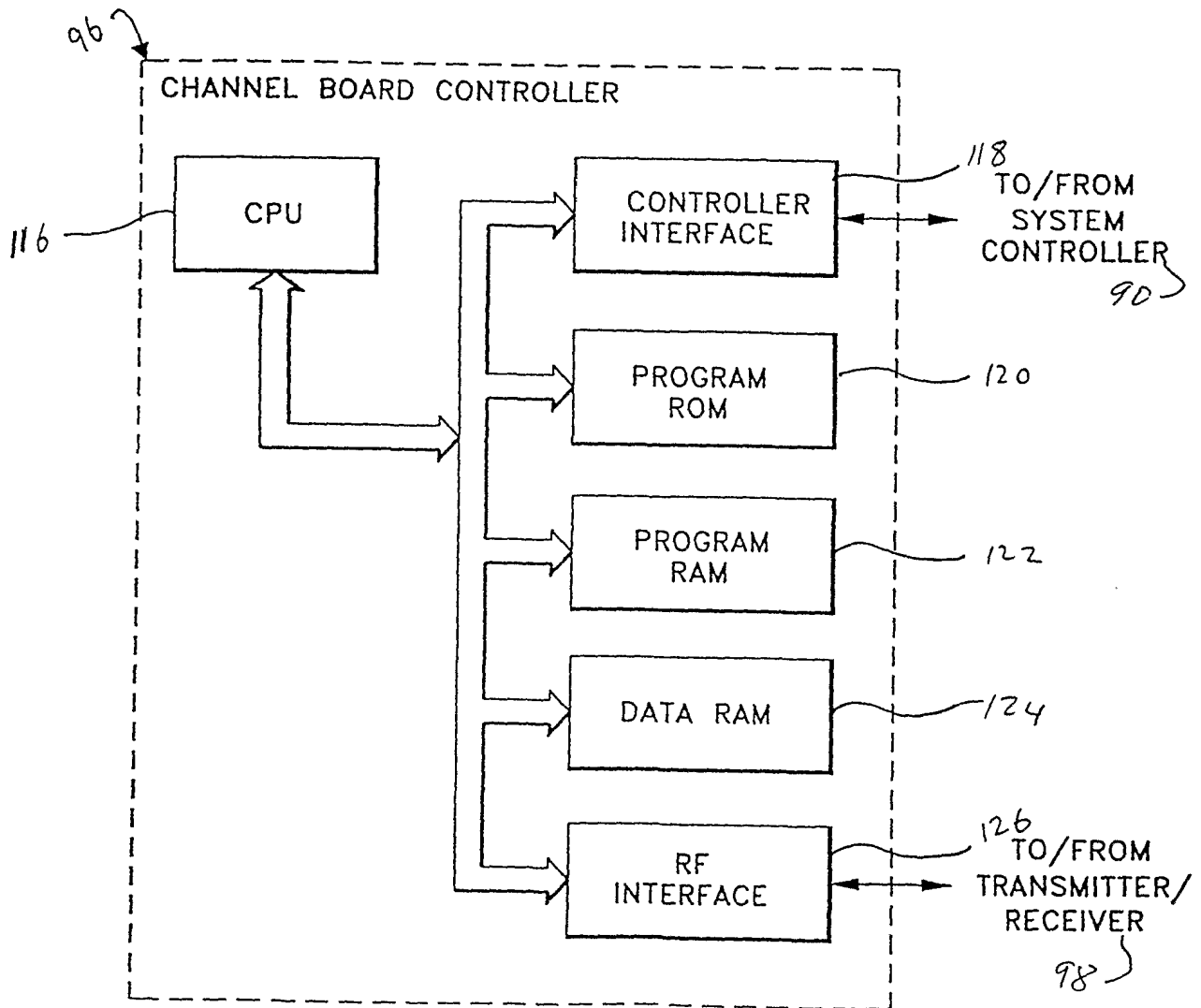


FIG. 8

7/10

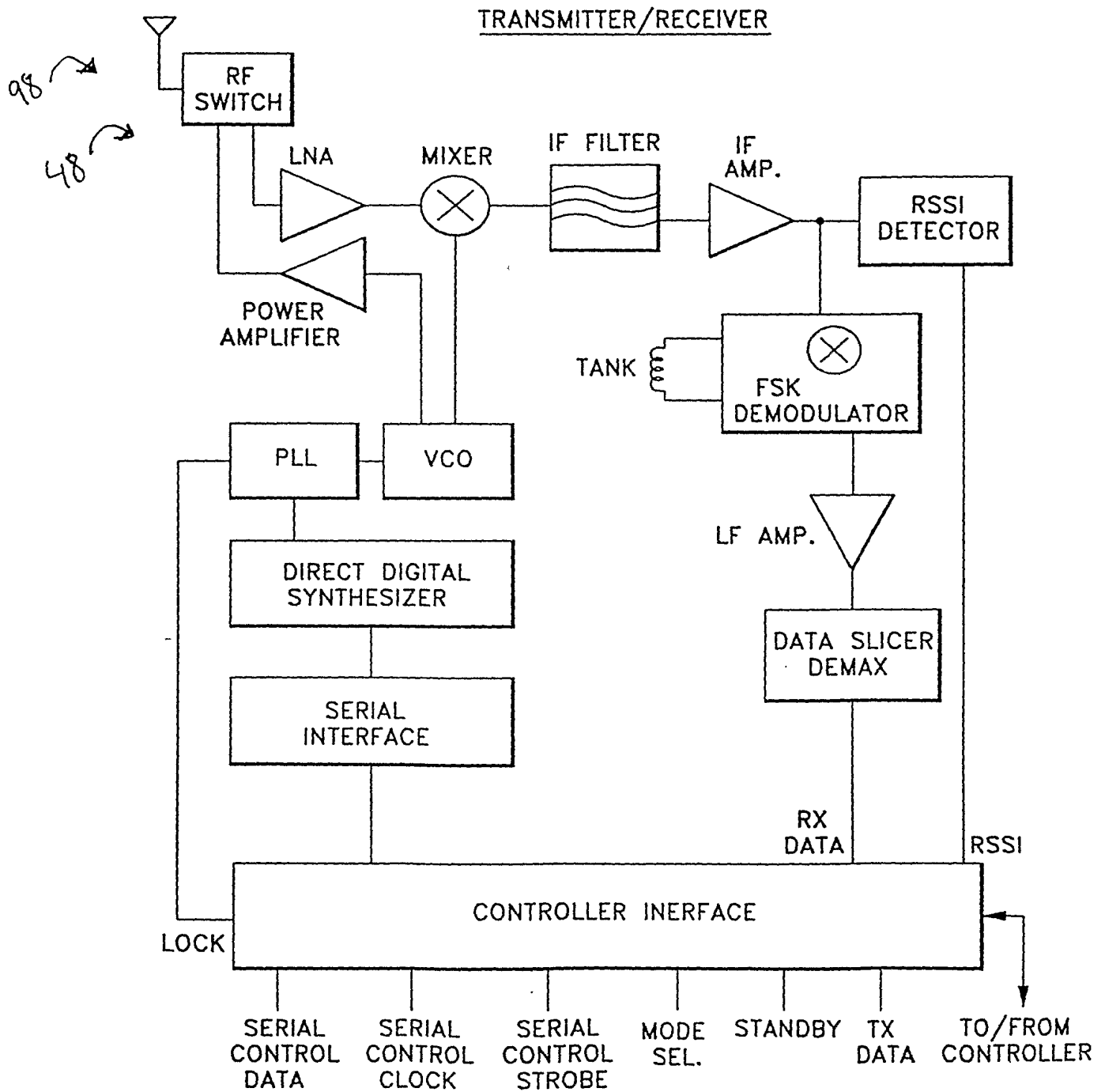


FIG. 9

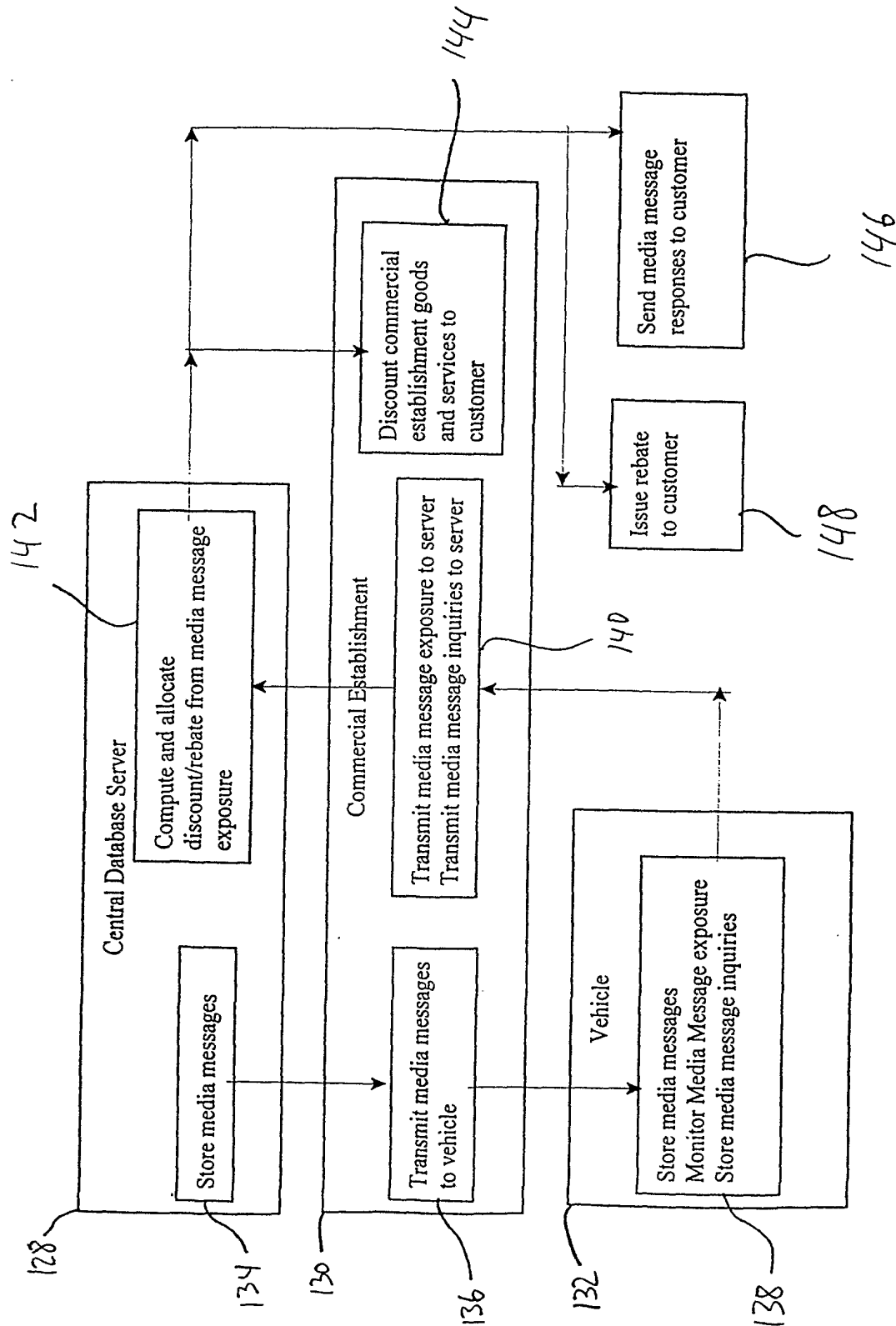


FIG. 10

9/10

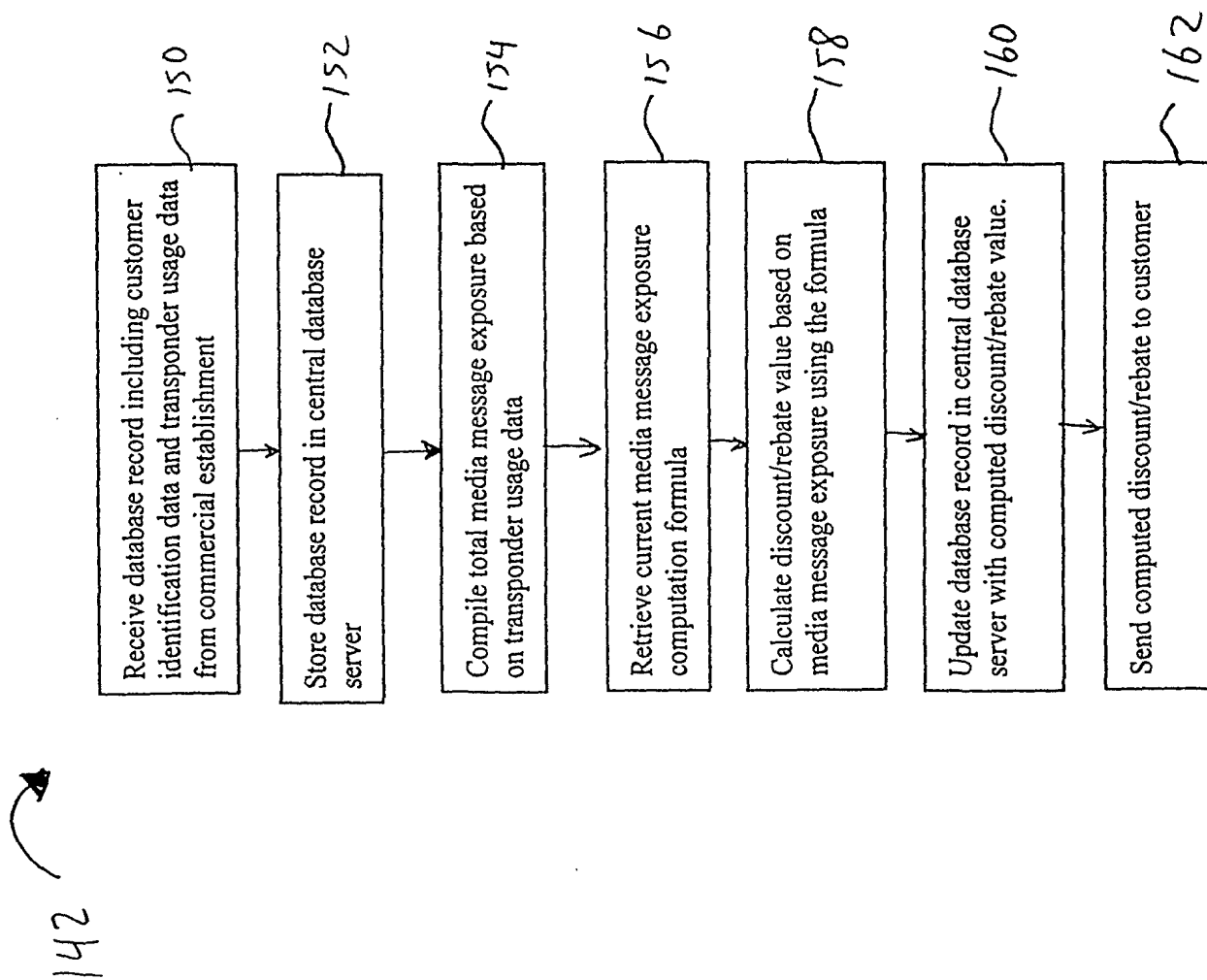


FIG. 11

10/10

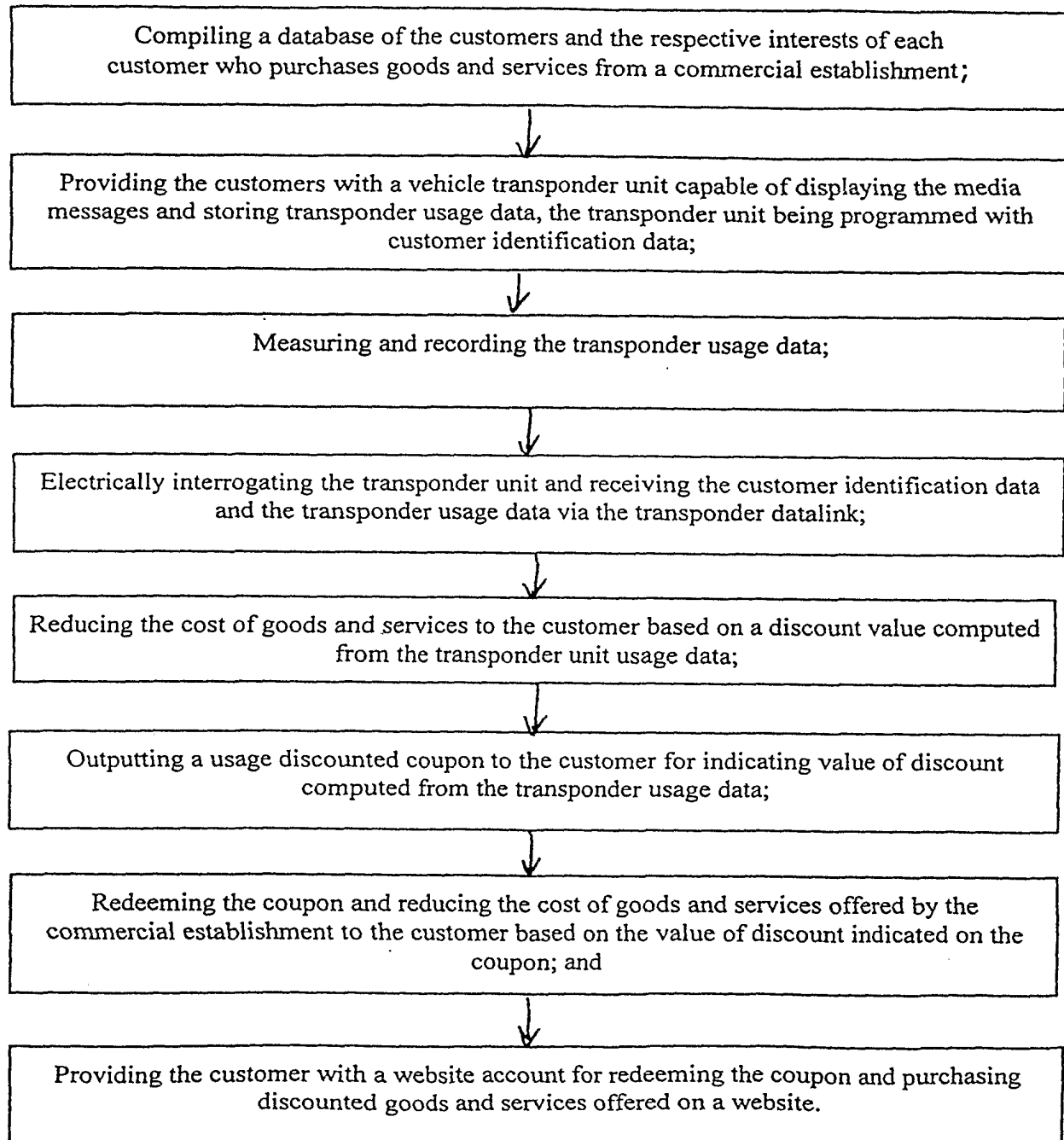


FIG. 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/22446

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :H04B 3/38; G007F 17/60

US CL :Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/14; 725/332, 36, 42, 1, 2; 701/211, 213,

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EAST

SEARCH TERMS: GPS, TRANSPONDER, LOCATION, ADVERTISIMENT, MESSAGE, ALERT, .

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y,P	US 6,182,010 B1 (BERSTIS) 30 JANUARY 2001, WHOLE DOCUMENT.	1-56
Y	US 5,539,395 A (BUSS ET AL.) 23 JULY 1996, WHOLE DOCUMENT.	1-56
Y,P	US 6,208,857 B1 (AGRE ET AL.) 27 MARCH 2001, WHOLE DOCUMENT.	1-56
Y,P	US 6,173,271 B1 (GOODMAN ET AL.) 9 JANUARY 2001, WHOLE DOCUMENT.	1-56
A,P	US 6,161,018 A (REED ET AL.) 12 DECEMBER 2000, WHOLE DOCUMENT.	1-56
A	US 6,006,159 A (SCHMIER ET AL.) 21 DECEMBER 1999, WHOLE DOCUMENT.	1-56

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 19 OCTOBER 2001	Date of mailing of the international search report 14 DEC 2001
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ERIC STAMBER Telephone No. (703) 305-8000

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/22446

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 6,123,259 A (OGASAWARA) 26 SEPTEMBER 2000, WHOLE DOCUMENT.	1-56
A	US 6,006,159 A (SCHMIER ET AL) 21 DECEMBER 1999, WHOLE DOCUMENT.	1-56
A	US 5,995,015 A (DETEMPLE ET AL) 30 NOVEMBER 1999, WHOLE DOCUMENT.	1-56

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/22446

A. CLASSIFICATION OF SUBJECT MATTER:

US CL :

705/14; 725/332, 36, 42, 1, 2; 701/211, 213,